

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application:

#### *Listing of Claims*

1. – 4. (cancelled)

5. (currently amended) An apparatus comprising:  
at least one integrated peristaltic micropump for pumping fluid to be  
analyzed;  
a plurality of integrated analysis chambers communicated to the at least  
one integrated peristaltic micropump; and  
a plurality of integrated analysis devices to test said fluid in said analysis  
chambers for an analyte  
where said analysis devices in said plurality of analysis chambers  
comprise an integrated LED and an integrated optical detector  
~~The apparatus of claim 4 where said integrated LED and integrated optical~~  
~~detector are~~ comprise means ~~tuned to an optical absorption line of said analyte.~~

6. (currently amended) An apparatus comprising:  
at least one integrated peristaltic micropump for pumping fluid to be  
analyzed;

a plurality of integrated analysis chambers communicated to the at least one integrated peristaltic micropump; and

a plurality of integrated analysis devices to test said fluid in said analysis chambers for an analyte

~~The apparatus of claim 1~~ where said micropump comprises:

an electro-deformable membrane;

a substrate disposed below said membrane and coupled thereto, a microchannel defined between said membrane and substrate, said microchannel having a longitudinal axis; and

an electrode structure disposed on at least one side of said membrane along side of said microchannel.

7. (original) The apparatus of claim 6 where said electro-deformable membrane is bowed to form a curvature having a symmetrical axis in the direction of said longitudinal axis of said microchannel.

8. (original) The apparatus of claim 6 further comprising a drive circuit coupled to said electrode structure to apply a sequential voltage along said plurality of opposing electrodes to peristaltically deform said electro-deformable membrane in the direction of said longitudinal axis of said microchannel.

9. (currently amended) The apparatus of claim 6 where said electro-deformable membrane consists ~~is composed of~~ p-type GaN.

10. (currently amended) The apparatus of claim 7 where said electro-deformable membrane consists ~~is composed~~ of p-type GaN.

11. (currently amended) An apparatus comprising:  
at least one integrated peristaltic micropump for pumping fluid to be  
analyzed;  
a plurality of integrated analysis chambers communicated to the at least  
one integrated peristaltic micropump;  
a plurality of integrated analysis devices to test said fluid in said analysis  
chambers for an analyte, and

~~The apparatus of claim 6 further comprising~~ two opposing pillars disposed on said substrate between said substrate and said membrane generally aligned in the direction of said longitudinal axis,

where said micropump comprises:

an electro-deformable membrane; a substrate disposed below said  
membrane and coupled thereto, a microchannel defined between said  
membrane and substrate, said microchannel having a longitudinal axis;  
and an electrode structure disposed on at least one side of said  
membrane along side of said microchannel.

12. (currently amended) The apparatus of claim 11 where said electro-deformable membrane is bowed to form a curvature having a symmetrical axis in

the direction of said longitudinal axis of said microchannel ~~The apparatus of claim 7 further comprising two opposing pillars disposed on said substrate between said substrate and said membrane generally aligned in the direction of said longitudinal axis.~~

13. (currently amended) The apparatus of claim 11 ~~8~~ further comprising a drive circuit coupled to said electrode structure to apply a sequential voltage along said plurality of opposing electrodes to peristaltically deform said electro-deformable membrane in the direction of said longitudinal axis of said microchannel ~~two opposing pillars disposed on said substrate between said substrate and said membrane generally aligned in the direction of said longitudinal axis.~~

14. (currently amended) The apparatus of claim 11 where said electro-deformable membrane is bowed to form a curvature having a symmetrical axis in the direction of said longitudinal axis of said microchannel and where said electro-deformable membrane is composed of p-type GaN,

~~The apparatus of claim 10 further comprising two opposing pillars disposed on said substrate between said substrate and said membrane generally aligned in the direction of said longitudinal axis.~~

15. (original) The apparatus of claim 14 where said two opposing pillars are composed of n-type GaN.

16. (currently amended) An apparatus comprising:  
at least one integrated peristaltic micropump for pumping fluid to be  
analyzed;  
a plurality of integrated analysis chambers communicated to the at least  
one integrated peristaltic micropump; and  
a plurality of integrated analysis devices to test said fluid in said analysis  
chambers for an analyte.

where said micropump comprises:

an electro-deformable membrane; a substrate disposed below said  
membrane and coupled thereto,

a microchannel defined between said membrane and substrate,  
said microchannel having a longitudinal axis; and

an electrode structure disposed on at least one side of said  
membrane along side of said microchannel.

~~The apparatus of claim 6~~ where said electrode structure is comprised of  
two opposing electrode substructures extending parallel to said microchannel.

17. (original) The apparatus of claim 16 where said two opposing  
electrode substructures each comprise a plurality of discrete electrodes arranged  
and configured to provide pairs of opposing electrodes on each side of said  
microchannel.

18. – 19. (cancelled)

20. (withdrawn) A method of fabricating an apparatus of microanalysis of fluidic analytes comprising: fabricating a micropump composed of nitrides of B, Al, Ga, In, Tl or combinations thereof using photoelectrochemical techniques, said micropump for pumping fluid to be analyzed; simultaneously fabricating a plurality of analysis chambers communicated to said micropump; and simultaneously fabricating a plurality of analysis devices to test said fluid in said analysis chambers for an analyte during, said analysis devices being masked from said photoelectrochemical techniques during fabrication of said micropump.